

Leica

PHOTOGRAPHY





Leica

PHOTOGRAPHY®

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COVER

Rolf Scholer

The photographer caught these two deer at the edge of a Vermont wood at dusk with a 400mm Telyt, Visoflex II and an M2. The exposure was on Ektachrome X at 1/30th second, using a tripod.

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◀ INSIDE COVER

Alice Mommersteeg

This picture of hoar frost on ivy leaves was made in a Dutch garden, using the close-focusing range of the 50mm Dual-Range Summicron. Miss Mommersteeg is a free-lance photographer in Vlymen, Holland whose work includes photojournalism, advertising and child photography. Leica M2. Afga film processed in Rodinal.

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The editors are happy to consider original articles on photography with the Leica and photographs taken with Leica cameras and lenses. All manuscripts and photographs should be accompanied by stamped, self-addressed return labels.

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The Leica Club Kansai

ライカクラブ関西

Members of Japan's exclusive Leica Club Kansai must not only be able to handle their cameras with technical and visual dexterity. They must, according to member Dr. Masao Sakamoto, have achieved "personal maturity" and distinction in their own profession as well. Dr. Sakamoto himself is a case in point. Presently attached to the New York State Psychiatric Institute, he will soon return to his own Psychiatric Hospital in Osaka.

The club was organized in 1958 and now has a limited membership of thirty. A member can be proposed only upon application by two current members which guarantees only that the application will be considered. Eleven members are presidents of their own companies. Others are executives of companies representing some of Japan's leading industries, from printing firms to distilleries and chemical corporations. Still others are well-known scholars,

Snow by M. Miyamoto ▶

Miss Kyodo by Seiziro Komai







◀ **Island In Biwa Lake** by M. Miyamoto



Scenery, Kyoto by M. Kometa



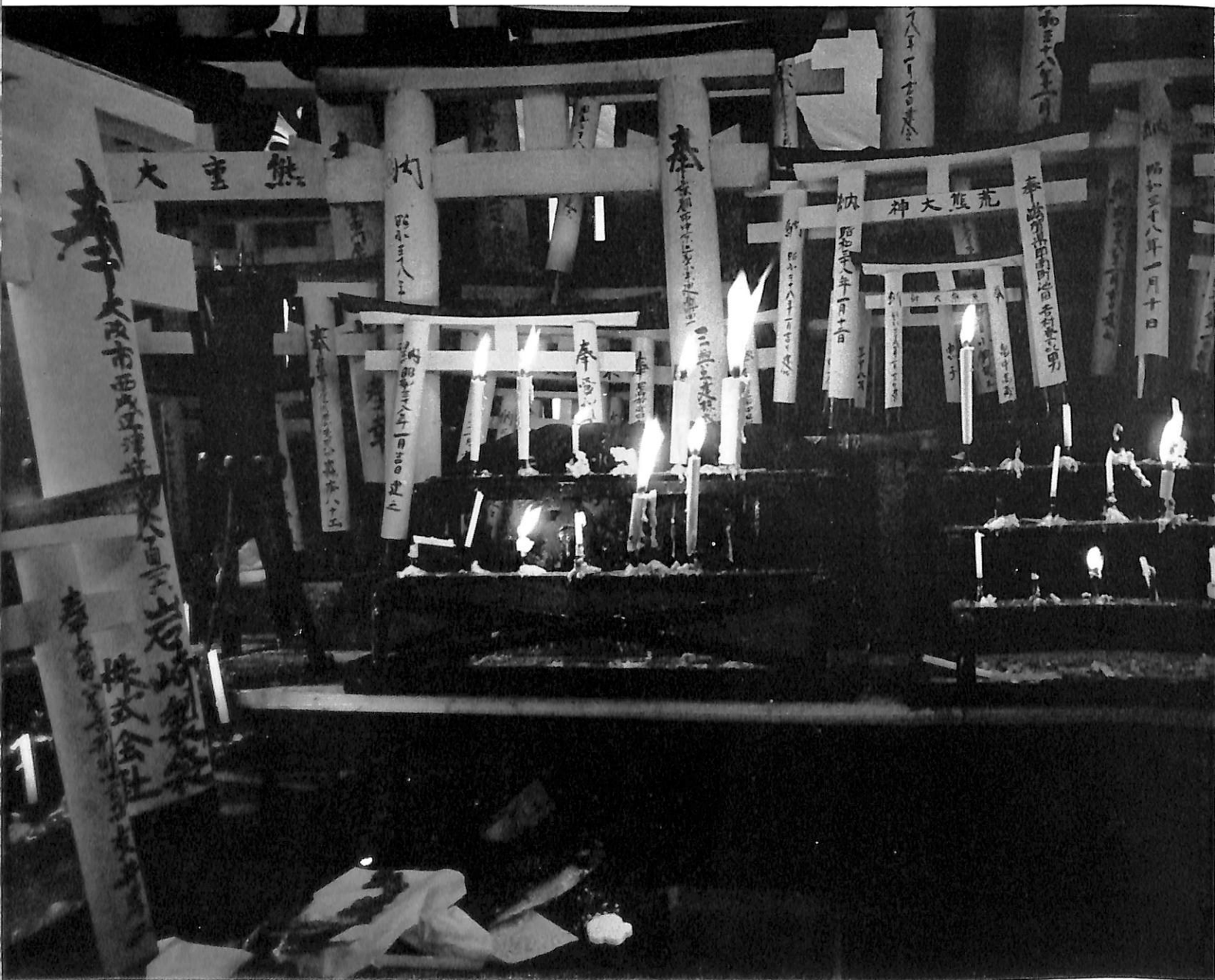


Late Afternoon by K. Tanaka

◀ **Fishing Port** by M. Kometa

Fujiyama by Yasuhiko Shimamura





Inari Shrine by S. Kamiy

doctors and engineers. They have in common a deep respect for, and a vital interest in the equipment they use. The Leica is the prestige instrument among Japanese photographers and is used only by the elite of the profession.

Members meet at dinners and occasionally have competitions. They also produce a bulletin featuring

news and photographs by members. Each photograph is tipped onto the hand-made parchment paper.

The photographs reproduced here are the work of various members. They reflect the dedicated craftsmanship of their own group, as well as the love for purity of line, the feeling for limpid light and shadow which is their national heritage. *Helen Wright*



PHOTOGENIC RHINE VALLEY is but one area which tour will visit.

another EUROPE-THROUGH-LEICA tour planned

group will visit Leitz factory

Lufthansa German Airlines' photo-oriented, jet-liner tour of Europe, so popular with photographers in past years, will again take off for the continent's most scenic areas next July 22nd. Tour members will visit Germany, Switzerland and Greece, including Rhodes and Crete.

Called "Europe Through Your Leica," the tour will be accompanied by an expert photographer and teacher who will guide tour members in the selection of photogenic locations and in solving technical photo problems which arise along the way. On a previous tour, Walter Heun of the Leica Technical Center, acted as a photo-guide and consultant. It is planned that he will also accompany the tour next July in the same capacity.

picture-worthy stops

The jet-liner tour, which is sponsored by Lufthansa, will leave from Kennedy International Airport, New York City for Hamburg, Germany, on July 22, 1965. For the following three weeks, the tour will visit such historic and scenic locations as Luebeck, Braunschweig, the Harz mountains, Stuttgart, Zurich, Athens, Rhodes, Crete, Frankfurt, Cologne and many others. Each offers numerous opportunities for photographs.

Leitz visit

A special feature of the tour will be a visit to the Leitz factory in Wetzlar, home of the Leica. Photographers will have a chance to chat with Leica experts who will be happy to answer questions about the manufacture and use of the famous camera.

After the factory visit, the group will travel from Wiesbaden to Cologne on a Rhine river steamer, providing views of the fabled vineyards, castles and villages of the area. On August 12, the tour will leave Cologne after breakfast aboard Lufthansa Jet Flight 402 departing for New York, where it will arrive at 4:55 p.m. the same day.

The tour's price will include round trip transportation from and back to New York City in jet economy class, tourist class in Europe. Motor coach and Rhine steamer transportation in Europe as well as hotel accommodations, most meals, most tips and taxes and the services of both a Tour Conductor and the photo consultant already mentioned are also included.

The anticipated cost of the tour will be \$1,190.00 per person.

For the full itinerary and other details of the tour, write "Europe Through Your Leica," at Lufthansa German Airlines, 410 Park Avenue, Dept. BV, New York, N. Y.

no-limit hunting — with your Leica / *Dade Rayfield*

you can shoot all year 'round

Hunting with a Leica is fun.

As a field sport, it also offers a challenge equal to that of hunting with a more conventional weapon. All the skills of the woodsman, plus those of the photographer, are called into play.

To some of us, hunting with a camera is a far more satisfying experience than hunting with a lethal

in Texas. In the surrounding rawhide land was an abundance of wildlife. I had been a reporter and news photographer before I enlisted in the Army, and photography had been not only my vocation but also my hobby during my service career. I decided to take up the hunt again, but this time I would hunt my wild friends with a camera rather than a gun.

camera hunting

I soon found that hunting with a camera was not easy. Skills necessary to bagging game with shotgun or rifle must also be possessed by the hunter who uses a lens. Concealment, knowledge of the habit of his quarry, quick and sure reflexes, and mastery of his weapon are no less important to the hunter-photographer than they are to the hunter with a gun.

Marksmanship is important. A telephoto lens with its narrow angle of view is indispensable when hunting with a camera, since the negative image must be large enough to produce a finished enlargement in which the subject may be found without using a magnifying glass. To obtain an image on photographic film large enough to see in the finished print, the hunter must often be close to his quarry that he could knock it over with a rock.

The field of view with a 200mm lens is 12° — far less than the area seen with the eye. Limited view, subject movement and the blending of its camouflage with the surroundings makes "marksmanship" both difficult and vital if you are to capture an image on film.

Following the practice of a "still" hunter, I usually wait until a bird or animal has come within an area on which I have already focused. There is seldom time to focus in the interval between the appearance and disappearance of the quarry. This procedure calls for patience, concealment, and a considerable knowledge of what the animal or bird is likely to do. Stalking the quarry is far more difficult for the hunter with a camera than it is for a man with a gun. An easy target for a shotgun or rifle may be too far off for the man with a camera. For a gun does not involve the relation of film speed to shutter speed, depth of field to aperture, negative image size to grain and resolution to the finished enlargement.

Some knowledge of basic photographic principles



AUTHOR uses homemade "kneepod" for telephoto shots in field.

weapon. We are the one-time hunters who have lost our desire to kill.

Back in Southwest Missouri, as a youngster, I hunted small game with a .410 shotgun. I ran 'possum and 'coon on good nights, and I trapped skunk and muskrat in season. Later, as a young man in Arkansas, I hunted duck, deer and turkey. I loved all of it. But I tired of hunting to kill and especially regretted it, when, occasionally game escaped wounded.

So, I quit hunting. But, I missed the outdoors. I wanted to pitch a tent, build a campfire, find pleasure and peace as a part of the great outdoors.

These things I did, but somewhat without purpose until I returned from the military and settled down



WHITETAIL FAWNS, alert and startled, required fast "trigger."

and the right photographic equipment for the job are vital to hunting successfully with a camera. I use the M2, Visoflex, 200mm Telyt, and a light meter. I would like the increased image size provided by the 400. But handholding a 400mm lens at relatively slow shutter speeds is a risky procedure. Besides, carrying even a Leica with a 400mm lens on a full day's jaunt in the hills can be tiring.

I also use a home-manufactured gunstock and a similarly improvised "knee pod." The latter is a Rube Goldberg device made from the suction cap of a Plumbers' Friend and ring-controlled pan head. The base of the head is secured in the hole intended for the handle of the Plumbers' Friend. Screwed into the Visoflex tripod socket, the suction cap supporting the

camera is placed on my knee when I am in a sitting position. Steadied also by the gunstock, the camera with telephoto lens can be hand-held for shots at shutter speeds as slow as 1/30 second. With this set-up, I have even hand-held my 400mm Telyt successfully at only slightly faster shutter speeds.

Seated on the ground with my back to a tree, I support my camera with the "kneepod" resting on my left knee. My left hand holds the pan head just under the lens barrel. Cradling the gunstock snugly against my right shoulder, I aim the camera through the Visoflex as a hunter would aim with a telescopic sight. My right hand holds the camera body, with index finger operating the shutter release and thumb advancing film and cocking the shutter.



SQUIRREL was photographed from author's ground-level blind.

patience needed

When I work in the field, I find that I must be patient and let the game come to me. I select a spot where past experience has shown me that I may expect to see deer, turkey or other of the larger animals or birds to be found in this locality. Under usual light conditions I have found that I can shoot at 1/125 second with my lens stopped down between f/5.6 and f/8. Using the 200mm Telyt, at 100 feet this setting gives me a depth of field of about 30 feet. I wait and I hope that some wild creature will enter the area included in my depth of field. There is seldom time to focus. None of my work is "posed," and I have yet

to see a deer come back for a retake.

Although roaming the hills is fun, I have found that working from a permanent blind is more productive. Wildlife can be attracted to the area in which your blind is located by providing food and water. Birds and squirrels soon learn where grain and water may always be found. Fresh water and a small patch of oats or other forage crop will attract deer from miles around.

I have two blinds. One, in the top of a tree, is intended primarily for deer. It commands an area of hills and draws far greater than can be adequately covered with even a 400mm lens. From it I first see deer at considerable distance and so am ready for them when they come into camera range. The other blind, basically for birds and squirrels, is built on the ground and commands but little view of the surrounding hills.

When I am shooting from a blind (especially the high blind for deer pictures) I work from a tripod with a 400mm lens which can then be used at comparatively slow shutter speeds.

I also use a tripod with the 200mm Telyt when photographing birds, and small wildlife from the ground-level blind because of the extremely shallow depth of field in which I must work. To obtain the largest negative image possible, I shoot from a constant distance of exactly 10 feet. Stopped down to f/8, the lens has a depth of field of only five inches. This means that the camera must be at the exact spot *from* which it was focused on a similarly exact spot *on* which it was focused. The trick, of course, is to get your subject exactly on the latter.

film and exposure

Although fine-grain, thin-emulsion film has the disadvantage of slow speed, (when you would like to use the maximum shutter speed combined with great depth of field) I regard it as essential when hunting with a camera. I have yet to obtain a negative image that called for less than a 10 diameter enlargement to obtain a satisfactory subject image in an 8x10 print. Song birds and smaller animals usually require enlargement of 16 diameters or better to make a pleasing 8x10.

In making 16x20 salon prints, I have gone up as much as 25 diameters without objectionable grain or any considerable loss of contrast. Besides its high resolving power it has considerable exposure latitude.

I have experimented with both standard and special developers and have found that Ethol TEC with Pan-X is my choice for negatives intended for greater than 10 diameter enlargement.

I expose for the shadows. I want shadow detail in

the finished print and the only way I know to get it is to have it in the negative in the first place. Wildlife is usually shot in contrasty light and portions of the bird or animal are in shadow. I want my print to reproduce on paper what my eyes saw when I made the exposure.

For development in TEC, I rate Pan-X at 100 ASA. However, to get the vigorous negative I want, I regard this as a *maximum* rating to be used only on overcast days or in flat light. It is my "minus" exposure. For "normal" exposure, when making distant landscapes in which there is an equal distribution of highlights and shadow, I use 50 ASA. But I find that "minus" and "normal" exposures actually are seldom indicated in wildlife photography.

Most wildlife shots I make are under light conditions of from considerable to great contrast. The subject is usually either in spotted shade or in open sunlight. In either case, the scene is contrasty and, in my book, this calls for "plus" exposure. This means that most of my work is done with Pan-X rated at ASA 25. With Ethol TEC this rating gives me a negative that is vigorous and that has good shadow detail, but in which the highlights are not blocked and grain is not objectionable — even at great magnification.

do it yourself

Working in his own lab is another *must* for the serious wildlife photographer. Too much emphasis cannot be placed on darkroom discipline, temperature control, and cleanliness when almost every negative must be enlarged from 10 to 20 diameters. Dust, lint, scratches or other negative defects are usually disastrous.

My Focomat enlarger gives me 16 diameters enlargements with its normal projection lens, and I go up as much as 25 diameters with a wide-angle 35mm Summaron lens. (Being just a rule-of-thumb photographer, I do not know that the Summaron is not intended for projection work. Consequently, I get good results with only a fraction of a negative when making 16x20 salon prints.)

Dust is probably the major problem in any 35mm work, so I have found that my investment in a professional static eliminator is worthwhile.

The right photographic equipment for both the field and the darkroom is as necessary to the hunter with a camera as is the right weapon to the more conventional hunter. However, there is something still more important. Patience. I hunted almost a year (and suffered the frustration of the damned) before I made my first "kill." And my first trophy was only a Texas bluejay, of which there are literally thou-



TEXAS BLUEJAY was Rayfield's first "kill" as a camera-hunter.

sands in this locality, perched for the moment on a cedar branch.

I hunted for more than a year before I bagged a deer, and my target was not a 12-point buck. It was not a buck at all, but only a doe yearling.

Yes, hunting with a Leica offers a challenge equal to that of more conventional weapons. I marvel at the work of the professional wildlife photographer. However, the hunter with a camera is not restrained by closed seasons, protected wildlife, or any other game laws restricting the conventional hunter. Anything that moves is fair game to the nimrod with a Leica, any season of the year.

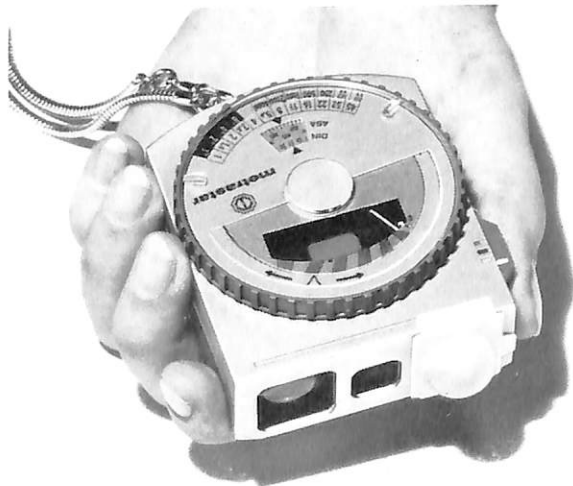
new "Metrastar" CdS meter has viewfinder

accurate aim, high sensitivity are features

Should an exposure meter so sensitive that its dial carries exposure times up to eight hours have its data marked in luminous paint? The new Metrastar CdS meter lacks a luminous dial — but that's about all it lacks for the sophisticated measurement of proper exposure.

The Metrastar meter, by Metrawatt of Nuernberg W. Germany, (makers of the Leica-Meters) is a compact hand-held exposure meter that combines extreme sensitivity, fast handling and accurate, selective aiming. It will accurately measure the light-levels for virtually any conceivable picture situation.

METRASTAR has viewfinder as well as incident light adapter (r.).



direct-setting dial

As the appropriate index arrow is aligned with the light-level indicator needle, a series of correct aperture shutter-speed combinations is also automatically aligned. There is no delay, no need to transfer one dial reading to another dial to solve the exposure problem.

A series of apertures from $f/1$ to $f/45$ is shown on one scale, and a series of shutter speeds from $1/4000$ th second to eight hours is on an adjacent one. Normal shutter speeds for motion picture cameras at 8, 16, 32 and 64 frames-per-second are also indicated.

two sensitivity ranges

Two response ranges — one for bright light, one for dim — are provided in the new meter. Its low-light response is so tremendously sensitive, that no booster cell or other "crutches" are needed for even the murkiest existing-light photo situations. For instance: for an $f/11$ aperture with 50 ASA film, the Metrastar will measure light levels calling for exposures as long as one-half hour.

Two index arrows are provided on the setting dial of the meter. A black triangle is used for setting the dial in low light and a white one for bright light.

MEASURING ANGLE (18°) about equals 135mm lens on 35mm film.



And the Metrastar's designers have arranged things so that the meter automatically switches to the proper sensitivity as you bring either arrow into position to align it with the light-level indicator needle. You can't make a mistake or use the wrong range.

narrow acceptance angle

The CdS cell of the Metrastar sees only an 18° field of view — about the same as that of a 135mm lens on a Leica. This means that, in reading light levels, you can pinpoint the exact picture area which is most important and guarantee that it will be accurately exposed. Meters with wide acceptance angles (unless used close up) necessarily will include not only the area in which you are interested, but many unwanted shadow and highlight areas of widely varying brightness. This results in a compromise exposure for all the included areas, rather than the best one for the subject of most importance.

DIAL reads directly, needs no scale-to-scale shifting of number.



For those times when it is more useful to measure incident rather than reflected light to determine exposure, a hemispherical adapter is provided. It remains attached to the meter at all times, and can instantly be slid over the meter lens when needed.

matching viewfinder

To take advantage of the highly selective acceptance angle of the Metrastar, there's a viewfinder whose field matches that of the photo cell. Positioned in the same field of vision as the indicator needle and dial of the Meter, the brilliant reflex finder permits you

to aim directly at the most vital picture area.

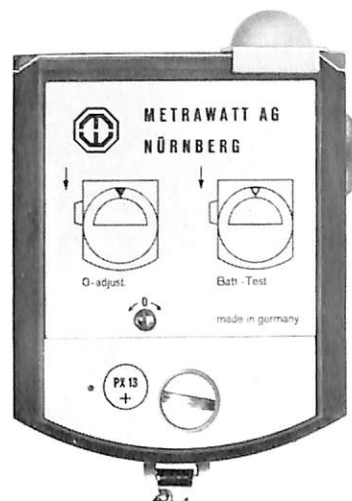
Another aid to accurate exposure is the needle lock which holds the exposure indicator needle in place after the reading has been made. Changing the point of aim of the meter before you have aligned the dial scales will not cause the needle to move or produce incorrect recommendations.

servicing ease

Every year or two, the battery which powers the meter (Mallory PX 625) will need replacement. Provision for testing battery strength is built into the meter. With the meter in its high light-level range, the actuating switch is pressed to a special battery-check mark. A healthy battery causes the indicator needle to swing to a special red mark on the needle scale. If the needle fails to reach this mark, the battery should be replaced.

Should the zero setting of the light-level indicator needle ever get out of adjustment, it can quickly be

BACK OF METER has diagrams for meter-check, zero adjustment.



reset with a screwdriver by means of an adjustment screw on the rear of the meter.

The Metrastar meter is designed to provide the sensitivity and selectivity demanded by the expert — and the simple foolproof operation that gives even beginners an expert's results.

The Metrastar, complete with brown leather carrying case, 46-inch flexible metal carrying chain and Mallory PX 625 battery (Cat. No. 14,250) is \$66.00. (Initial deliveries of the Metrastar will be limited, but the meter will become available in greater quantity after the first of 1965.)

the village of Assisi / Robert K. Sharpe

a Leicaman's impressions

Robert K. Sharpe is a television producer-writer-director who is also an uncommonly perceptive non-professional photographer. The pictures accompanying his text show the high caliber of his work. They are all the more laudable for having been made on the hurried schedule of a tourist. . . . Ed.

A hundred miles by winding road from Rome, a hundred miles by winding road from Florence, past shepherd and sheep dog, high in the hills in the province of Perugia lies the village of Assisi. On

its site was born the Roman poet Propertius. In its churches are the works of Giotto, Cimabue, Cavalini. Above it towers the ruins of the mediaeval castle built by Cardinal Albornoz and added to by Pope Pius II and Paul III. Below, its narrow streets and architecture form a tapestry almost unchanged from the time of St. Francis who was born there and died there.

These pictures were taken in a period of four hours on an afternoon in July. They are not meant to be an historical record or a detailed analysis, rather a





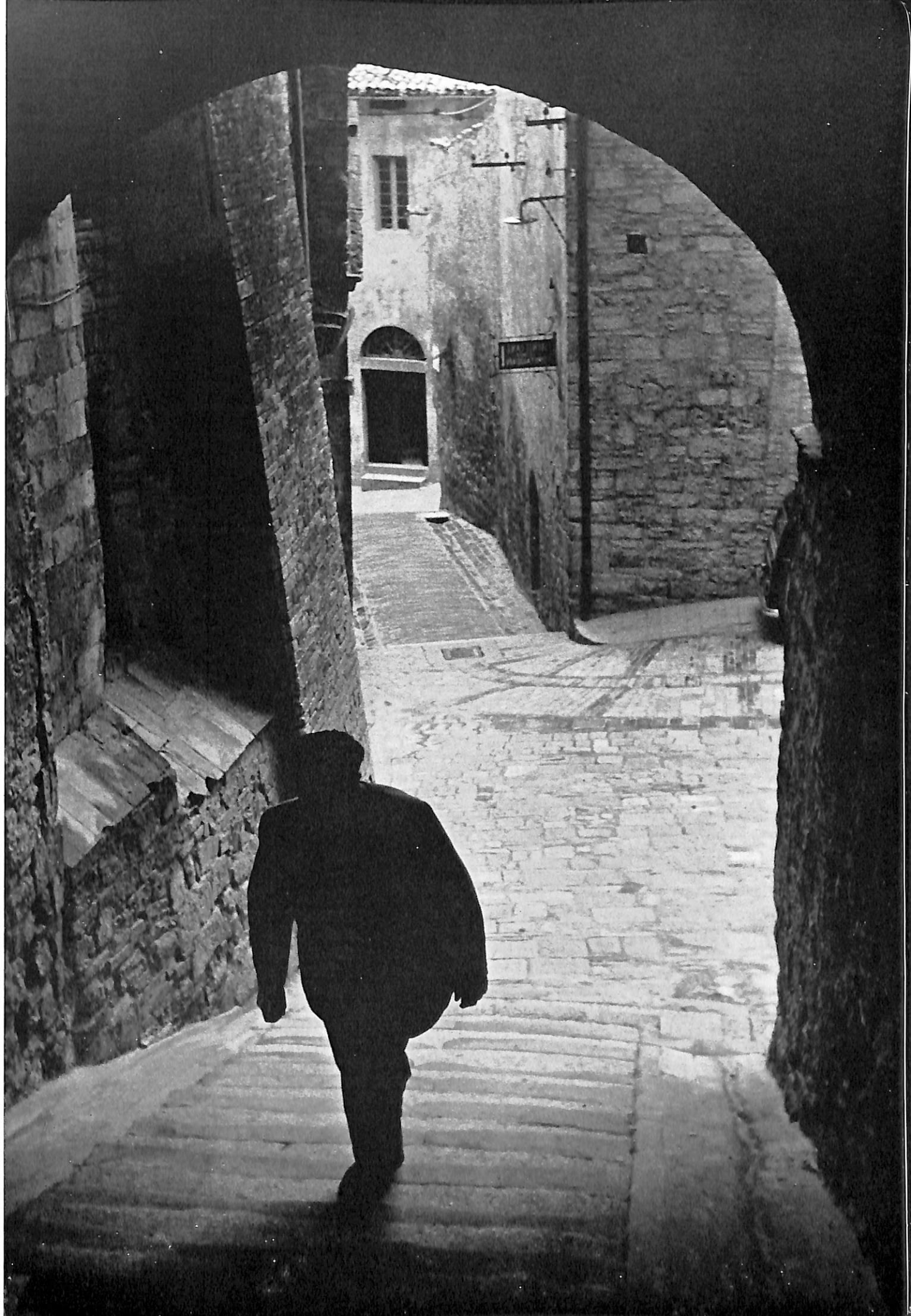
series of acute glances. The past of the village of Assisi stretches backwards some 2,000 years. Surrounded by it, related somehow inescapably to it, are the people of the village who eat and eke out their existence in the present. Theirs is not a rich village — in treasure yes, but in wealth no. Much of their income is derived from the tourists who wander down their streets and through their churches. The people have given in only a little. I saw an automobile looking rather distraught and out of place among the mediæval doorways. The proprietress of a hotel looked for business through a drawn curtain from beneath two Coca-Cola signs. A woman in the doorway of her shop almost became a part of the mosaic of tiles and china. And before the six Corinthian travertine columns of the ancient Roman Temple of Minerva, a man in a grey cap sold shiny new pottery. For an occasional moment one might have thought that the only power in the village of Assisi was the slowly dying rumble of history. Yet in the square where the narrow streets entered, there was a nervous energy. A black and white cat looked down from a window and two women and three men pondered while another turned to look and across the square another stood. By the fountain three men sat and were silently proud of something. A group of nuns flowed silently past, yet within the group . . . the glancing expression, the flickering word. Away from the square, down the straight street, carrying a black umbrella and a long, wrapped loaf of bread, perhaps on his



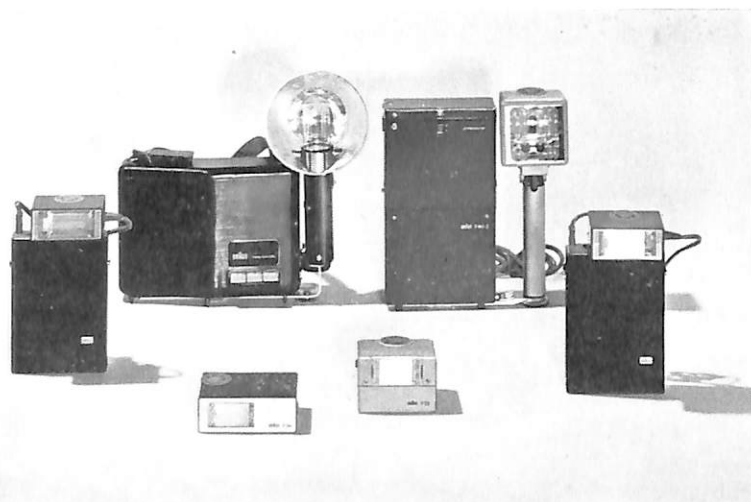
way to supper, came the old man in the baggy, ill-fitting suit. He stopped before a sign which I could not read and before which he himself seemed somehow inadequate.

Always there was the silent barrier, three thousand miles, two thousand years, separating the visitor from another way of life, like the quiet, falling folds of the nun's gown there before the doorway. Always the unanswered question . . . the dark doorway, the cobblestones, the man.

And beyond the village in the hills, surrounded by mist was the shepherd. He and his dog kept vigil. When he turned to confront me, it was like the past returning from a timeless void.



gift list



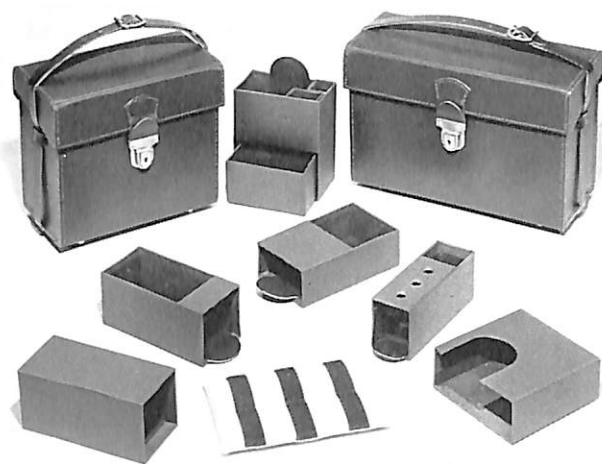
Braun Hobby Electronic Flash

Whatever your needs in electronic flash, there's a Braun unit to meet them. From the little F 26 (a complete unit small enough to fit on top of your camera) to the professionally powerful, magnificently versatile F 80-2, the transistorized Braun flash units embody the latest in electronic miniaturization. Among knowledgeable photographers, the quality and reliability of the Braun units are famous.



Leica Books

No photographer we've ever met is so expert that he can't benefit from reading a good photo book. And, since no one is likely to exhaust the versatility of the Leica, a good book about its potential uses is welcome on any photo book shelf. Incidentally, the Leica has had more books written about it than any other camera. "The Leica Way," and "The Leica and The Leica System" are two of them. Your favorite Leica-man will be delighted with any of them.



Benser Cases

Odds-on favorite to win the gadget-bag space race is the infinitely variable Benser carrying case. It features custom fitted inserts for virtually any combination of Leica items, any or all of which can be removed or replaced instantly. The Benser case holds more equipment for its volume than any other gadget bag we know of. Secret of its success is the box-like inserts which enable you to use every cubic inch of space in the case. Choose the Model I for day-trips and casual shooting, the larger Model II for professional or advanced amateur use involving more extensive Leica outfits.

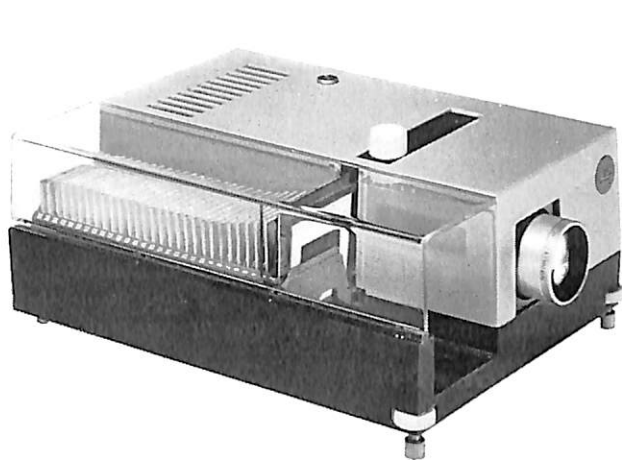


Perrot Slide Binders

Next to a fine projector, your treasured color slides have no better friend than a good slide binder. Perrot slide binders put your transparencies between glass, protecting them from scratches and dust.

There are several types of Perrot binders. The Perrot-Color mounts accept 24 x 36mm transparencies which have been removed from their cardboard mounts. A special ultra-thin version of this mount is also available for use in slide magazines which ordinarily do not accept transparencies in glass mounts. Another version of Perrot-Color mounts offers specially-treated glass which prevents Newton's Rings.

Per-O-Slide binders accept 24 x 36mm slides complete in their cardboard mounts, for those who prefer to avoid demounting their films.



Pradolux and Pradovit Projectors

No matter how good your slide, it is only as good as the projector which recreates its image on the screen. Leitz projectors are designed to preserve all the richness of which Leica slides are capable. Indeed, both camera and projectors are made by the same group of craftsmen. For the connoisseur, the auto-

matic Pradovits combine luxurious convenience with unmatched versatility. For those who demand modest cost without sacrificing optical and mechanical excellence, the Pradolux is a happy choice. Look over the Pradolux, the Pradovit FA 500 and the low-voltage, low heat Pradovits N and N24 soon.



Trinovid Binoculars

The design of Leitz Trinovid binoculars is new and unique. No other glasses offer so much brilliance, power and optical performance in so small a package. Whether you choose the 6 x 24, the 8 x 32, or the 10 x 40 model Trinovid, you have a binocular small

enough to slip into your pocket, yet one which performs at a level with older-style glasses having far greater weight and bulk. Any of the three models is a perfect gift-for-a-lifetime for your favorite sports fan, birder, outdoorsman or hiker.

shoot for the moon / *J. Schumacher*

make sky photos with or without a telescope

Practically every phase of photography can be approached with the Leica, and astronomical photography — either with or without a telescope — is well within its realm. As a matter of fact, I have found the combination of Visoflex II and M-3 to be highly adaptable to this fascinating science!



BARLOW LENS increased focal length of 'scope for moon photo.

CUSTOM MADE ADAPTER fits Visoflex II to the author's telescope.

In this article I will refer chiefly to photographing the moon. But many of the considerations of lunar photography are easily applied to other celestial ventures.

through a telescope

At first we should consider the telescope. All types are usable, but the reflector type (of either Newtonian or Cassegrain design) is usually more popular due to color correction and relatively low price per inch of aperture. (Resolution increases directly in proportion to the size of the objective, so a reflector offers more resolution-per-dollar than a refracting telescope, although the latter may have other advantages over a reflector . . . Ed.) A good start might be a six-inch Newtonian reflector. A motor drive, while desirable, is not absolutely necessary, but a sturdy equatorial mount is truly required. An equatorial mount permits a celestial object to be viewed with only one telescopic motion, once the 'scope has been set.

Adapting the Leica-Visoflex combination to the draw tube of a telescope is, happily, no great task. Various adapters can be acquired commercially. (One source is the Criterion Manufacturing Co., 331 Church St., Hartford 1, Conn. . . Ed.) I use the rear section of the OUBIO adapter (Cat. No. 16,466) to fit the Visoflex II onto the draw tube of my 'scope, which is an 8-inch Cassegrain. This particular adapter is used when only the main elements of the telescope are focusing the image. In my telescope this would be called the Cassegrain focus (see dia-



gram). This is the final focal point of the optical system when no eyepiece or other magnifying lens is used. The image is always best at this point. I use extension tube OUFRO (Cat. No. 16,469) when an adapter for projection with an eyepiece is desired.

A highly important factor in any kind of photography is, of course, correct focus. And I have found that the Visoflex with its 4X Eye-Level Magnifier, is excellent for this purpose in astronomical work. Its field is excellent, and the image is clear and crisp. But careful focusing is imperative and it will take a little effort, regardless of the ease of manipulation.

avoiding vibration

Another big advantage with the Visoflex is the fact that the shutter can be released on the camera after the mirror has been raised and locked out of the way.

This insures a steady image under conditions which magnify greatly any vibration in the telescope-camera system. Incidentally, this factor of vibration can be present regardless of the shutter speed used. I found this out after a number of failures, and I have blessed the design of the Visoflex which helps in overcoming this difficulty.

My illustration of the moon indicates that high speed film can be used without producing objectionable grain, and without the need for a motor drive. But notice that the speed used was shorter than 1/60th of a second. If the camera-telescope combination is on a sturdy mount and the shutter is released with a cable release after the mirror is retracted and the system has been allowed to cease vibrating, you will be on the way to sharp results.

With films like Tri-X (rated at 1200 ASA with high performing developers such as Acufine) you can shoot at speeds not requiring a motor drive. A speed of 1/125th will stop lunar motion very nicely. But it will not stop camera motion or vibration from wind, so a choice of the correct moment is required for shutter release. On a clear, windless night, and

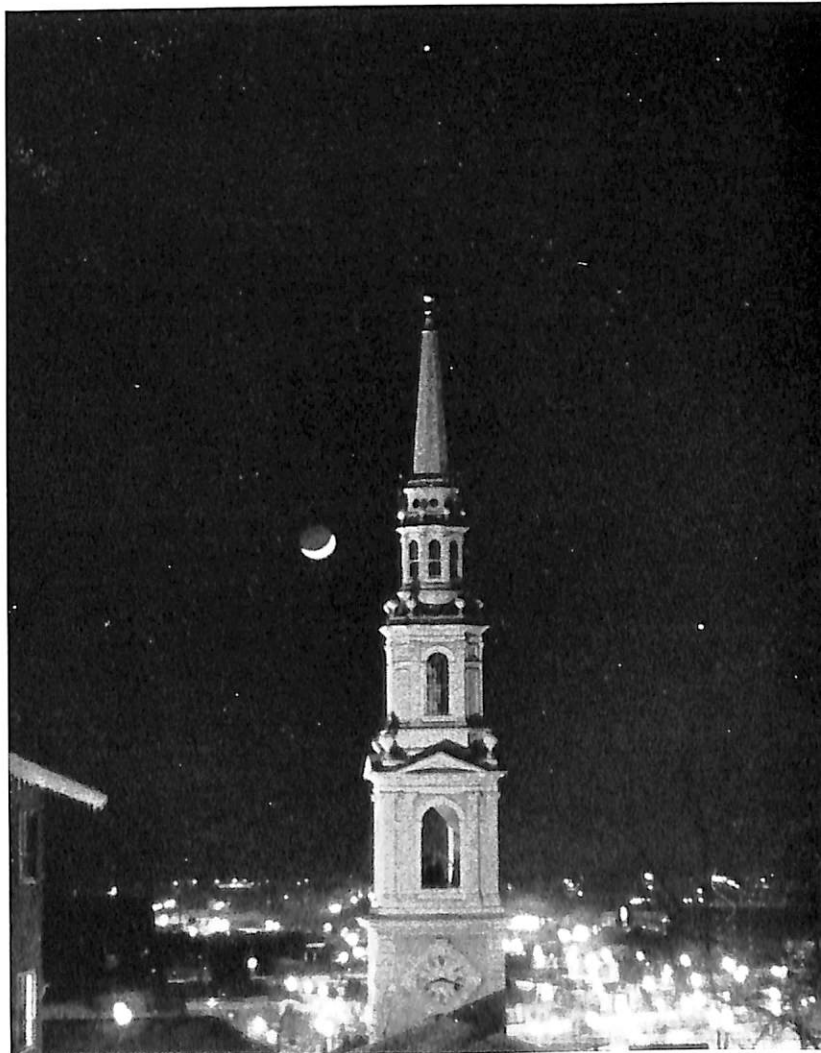
AVERAGE LUNAR EXPOSURES FOR f/15 TELESCOPE

Film Type	ASA Rating	Full Moon	1st Quarter	New Moon
Tri-X	1200	1/250	1/125	1/60
Plus-X	320	1/60	1/30	---
Adox 14	64	1/30-1/15	---	---
Kod. II	26	1/5	1/8-1/2	---

Exposure speeds for f/8 telescopes should be approximately one fourth those given above (i.e. 1/125th instead of 1/30th, etc.). Telescopes of other apertures should, of course, also have the camera shutter speed adjusted appropriately.

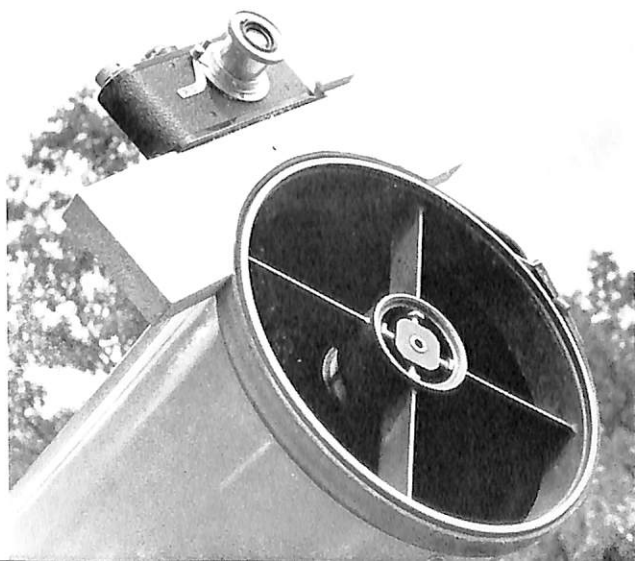
Speeds longer than 1/30th second should not be used unless the telescope has a clock drive.

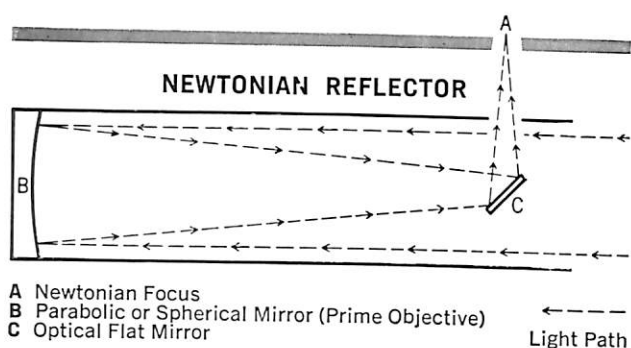
Photo by Patrick D. McDonald



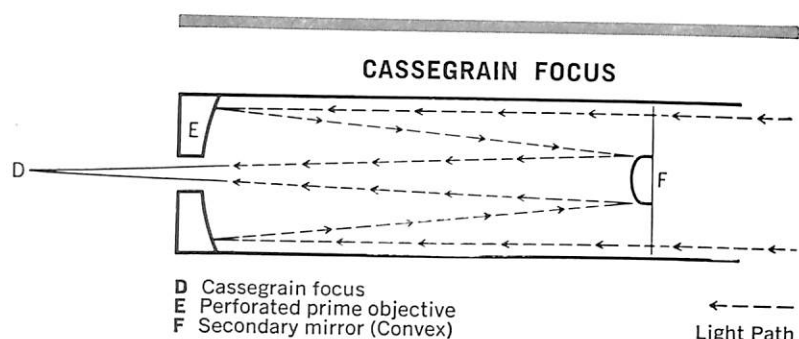
MOON, JUPITER, VENUS pictured with 50mm Elmar, 1 sec., Tri-X.

MODEL A LEICA rides homemade saddle atop Cassegrain telescope.





Focal length is distance B-C-A; f /number is determined by dividing focal length into diameter of mirror B (objective). For instance: a 6-inch diameter mirror with 48" f.l. would have an $f/8$ aperture.



Folded light path of Cassegrainian 'scope permits longer focal length. This, however, dictates a smaller f /stop with a given-size mirror. Newtonian 'scope in example above has $f/8$ aperture. If six-inch mirror in Cassegrainian model had, for example, a 96-inch focal length, its f /stop would be only $f/16$. Cassegrainian focal length is equal to distance from primary to secondary mirror, *plus* distance from secondary to focus.

A full moon image at the prime focus of a 'scope will have a diameter roughly 1/100th that of the focal length. For instance, a 45-inch focal length will yield an image about 0.4 inches in diameter on the negative.

when no vibration is present in the system, speeds as low as 1/30th second are often practical, even without a motor drive.

telescope f / number

Newtonian telescopes, while not offering a prime image as large as an equal-size Cassegrain, do offer a greater light-gathering power (see diagram) and therefore a shorter exposure can be used. The f /number of a telescope is determined in the same way as that of a camera lens. The diameter of the prime lens (or mirror) is divided into the focal length for infinity.

Exposure varies considerably in celestial photography in general and lunar photography in particular. Perhaps the greatest cause of this variation is atmos-



ORION. Taken with 90mm lens, using 'scope saddle, clock drive.

pheric conditions in the locality and at the time of the exposure. The accompanying chart can be used as an average guide for moon shooting, but I suggest bracketing exposures and perhaps some record-keeping until you build up experience at determining the right exposure for prevailing conditions.

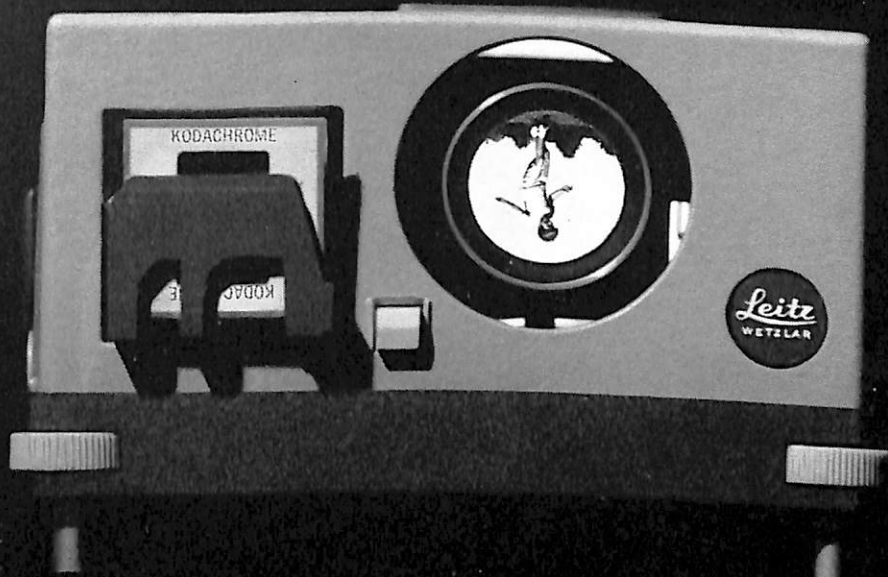
To bring out contrast when desired in a moon print, I use high contrast paper and fast film rather than the slower high contrast films. The slow films may be your choice, but of course longer exposures will be required and the use of a motor drive will be needed.

camera lenses alone

Much astronomical photography can be done with camera optics alone. Stars are so far away that they show up only as points of light, regardless of the magnification of the telescopes used. So, there is no reason why ordinary camera lenses can't be used to make pictures of star fields — particularly when you want to include a fairly wide portion of the sky. One of the accompanying photos in this article shows a view of the constellation Orion made with only the 90mm lens. It was taken by mounting the Leica on the telescope and using the 'scope's clock drive to make a 10-minute exposure. Star photographs made without a clock drive will show "star trails" which are pictorially interesting in themselves. That is, star images will reproduce on the negative as streaks, due to the motion of the earth during a long exposure. Their length will vary according to the length of the exposure.

There is still much to be learned in the technique of celestial photography, and you will find in the Leica a marvelous tool in this relatively new pursuit.

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40	8	5	60	1250	\$84.00
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48	9-12 (Dry Cells)	6-7	up to 350 (Dry Cells)	1350	Dry Cell Unit: \$69.50
F 65 A lightweight powerful two-piece unit					
56	9	5	65	2000	\$92.00
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